

CLAIMS

What is claimed is:

- 1 1. A method comprising controlling access of computer network components to
2 the network's communication medium as specified by a medium access control
3 (MAC) protocol, the MAC protocol describing a MAC header comprising multimedia
4 (MM) extensions, including a MM control field, to facilitate the communication of
5 MM data between the network components.
- 1 2. The method of claim 1 wherein the communication is via a wireless medium.
- 1 3. The method of claim 2 wherein the communication is a radio frequency
2 communication.
- 1 4. The method of claim 3 wherein the radio frequency communication comprises
2 frequency hopping spread spectrum schemes.
- 1 5. The method of claim 3 wherein the radio frequency communication comprises
2 direct sequence spread spectrum schemes.
- 1 6. The method of claim 2 wherein the communication is an infrared
2 communication.

1 7. The method of claim 1 further comprising a multimedia capability indicator in
2 a management frame.

1 8. The method of claim 1 wherein the MAC protocol further defines a capability
2 field within a management frame, the capability field comprising information
3 regarding the network component multimedia capabilities.

1 9. The method of claim 1 further comprising a set of parameters included in the
2 initial communications between two network components, the parameters indicating
3 whether the channel of communications is shared and/or the type of network
4 component including proxy coordinator and master coordinator.

1 10. The method of claim 1 further comprising a definition for a multimedia
2 command frame.

1 11. The method of claim 10 wherein the multimedia command frame comprises
2 multiple commands and acknowledgements transmitted from a one network
3 components to one or more of the network components.

1 12. The method of claim 11 wherein a one network component groups two or
2 more multimedia commands intended for a second network component in a command
3 sub-block.

- 1 13. The method of claim 12 wherein the multimedia command frame further
2 comprises a destination address and the command sub-block length.
- 1 14. The method of claim 1 further comprising a frame control field (FC) wherein a
2 type for multimedia data communication may be indicated.
- 1 15. The method of claim 14 wherein the FC field consists of the first 16 bits of the
2 MAC header transmitted by the network component.
- 1 16. The method of claim 1 wherein the MM control field comprises a frame
2 position subfield.
- 1 17. The method of claim 1 wherein the MM control field comprises a subfield to
2 indicate the number of bytes padded with zeroes in the current frame.
- 1 18. The method of claim 1 wherein the MM control field comprises a subfield to
2 indicate an identification assigned to a group of network components
3 communicatively coupled with another network component designated as a point
4 coordinator.
- 1 19. The method of claim 1 wherein the MM control field comprises a subfield to
2 indicate an index number for a multimedia data stream being transmitted between the
3 network components.

1 20. The method of claim 1 wherein the MM control field comprises a subfield to
2 indicate a frame number of a multimedia data stream frame associated with said MM
3 control field.

1 21. The method of claim 1 wherein the MM control field consists of 24 bits.

1 22. The method of claim 21 wherein the 24-bit MM control field consists of five
2 sub-fields.

1 23. The method of claim 22 wherein the five sub-fields consist of:
2 a first 2-bit sub-field indicating a frame position within a series of frames,
3 a second 2-bit sub-field indicating the number of bytes padded with zeroes in
4 the current frame to make the entire frame 4-byte aligned,
5 a third 4-bit sub-field indicating an identification number assigned to a group
6 of network components communicatively coupled and controlled by a one computer
7 network component designated as a point coordinator,
8 a fourth 8-bit sub-field indicating an index number for a multimedia data
9 stream being transmitted between the network components,
10 a fifth 8-bit sub-field indicating a frame number of a multimedia data stream
11 frame associated with said MM control field.

1 24. The method of claim 1 wherein the MM control field is the last MAC header
2 field transmitted before transmitting a frame body.

32. A system communicatively coupled to other systems in a computer network, the system comprising a network interface that implements a medium access control (MAC) protocol to control access to the network's medium, the MAC protocol defining a MAC header that comprises multimedia (MM) data communication extensions, including a MM control field, the MM data communication extensions available for communicating multimedia data to or from other network components or systems communicatively coupled to the network.

33. A machine-readable medium that provides instructions, which when executed by a machine, cause said machine to communicate in a computer network by accessing the communication medium in accordance to a medium access control (MAC) protocol that describes a MAC header comprising multimedia (MM) extensions, including a MM control field.

34. In a computer network wherein network components communicate following a point coordinator function with contention free and non contention free periods, a multimedia capable computer network component comprising:

means for supporting DCF based contention period communications;

means for communicating with non multimedia capable network components

only during the contention period; and

means for establishing connections and negotiating bandwidth in the contention period using DCF mechanisms.

9 35. The multimedia capable network component of claim 34 wherein said network
10 component further comprises means for recognizing and using as time reference a
11 beacon from a point coordinator network component.

1 36. The multimedia capable network component of claim 34 wherein said network
2 component further comprises means for periodically providing its bandwidth
3 requirements to the point coordinator network component.

1 37. The multimedia capable network component of claim 34 wherein said network
2 component further comprises means for establishing multimedia data stream
3 connections with other multimedia capable network components.

1 38. The multimedia capable network component of claim 34 wherein said network
2 component further comprises means for supporting error correction and
3 retransmission mechanisms.

1 39. The multimedia capable network component of claim 34 wherein said network
2 component further comprises means for continuously measuring channel status and
3 periodically providing said measurements to the point coordinator network
4 component.

1 40. The multimedia capable network component of claim 34 wherein said network
2 component further comprises means for communicating without receiving a polling
3 signal from the point coordinator network component.

1 41. The multimedia capable network component of claim 34 wherein said network
2 component further comprises means for optionally measure and report collisions
3 during non-contention free periods.

1 42. The multimedia capable network component of claim 34 wherein said network
2 component further comprises means for communicating to two or more such other
3 network components during a contention free period.

1 43. The multimedia capable network component of claim 34 wherein said network
2 component is a point coordinator network component.

1 44. The multimedia capable network component of claim 34 wherein said network
2 component communicatively couple one or more other network components with a
3 point coordinator network component.

1 45. The point coordinator network component of claim 35 further comprising:
2 means for transmitting beacon frames; and
3 means for allocating transmission slots to different network components
4 within the contention free period of communications.

5 46. The point coordinator network component of claim 45 further comprising
6 means for monitoring bandwidth utilization by the network components during
7 contention free periods.

1 47. The point coordinator network component of claim 45 further comprising
2 means for renegotiating bandwidth requirements with other network components to
3 optimize bandwidth utilization.

1 48. The point coordinator network component of claim 45 further comprising
2 means for dynamically changing the communication channel used by all the network
3 components associated to said point coordinator.

1 49. The point coordinator network component of claim 45 further comprising
2 means for negotiating with point coordinator network components associated with
3 other sets of network components such that two or more sets of network components
4 can communicate within the same channel.

1 50. The point coordinator network component of claim 45 further comprising
2 means for monitoring the contention period of communications and assuring that
3 there is available bandwidth for at least one data frame plus acknowledgement in said
4 contention period.

1 51. The multimedia capable network component of claim 34 wherein said network
2 component may become an alternate point coordinator.

1 52. The multimedia capable network component of claim 51 wherein said network
2 component becomes said alternate point coordinator by a voting scheme among such
3 other multimedia capable network components.

1 53. The method of claim 1 further comprising communicating during a contention
2 free period in a time division multiplex operation without polling.

1 54. The method of claim 53 wherein the time division is performed by
2 negotiations between a point coordinator network component and one or more other
3 network components.

1 55. The method of claim 54 wherein the negotiations comprise the one or more
2 other network components requesting transmission time from the point coordinator
3 network component which allocates transmission time slots for the requesting
4 network components.

1 56. The method of claim 55 wherein the time requests and allocation comprise
2 commands transmitted between the point coordinator and the one or more other
3 network components within a command frame including other commands.

4 57. The method of claim 55 wherein a transmission time allocated to a network
5 component by the point coordinator remain unchanged until the point coordinator
6 allocates a different transmission time to said network component.